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THE BULLETIN
of

GASTROINTESTINAL ENDOSCOPY

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The President's Page

It might be well to review for a moment just what we did for our Society at the Chicago meeting last May and what the enormous change in our constitution seems to mean for the Society's purpose. As Paul Shallenberger pointed out during the post-banquet pleasantries, our organization was first an informal gastroscopy club, then a more formal gastroscopy society, then by mutual agreement an implied esophago-gastroscopy society. Now it changes its direction considerably, to become a panendoscopy society, still limited to the gastrointestinal tract and peritoneal cavity, to be sure, but with a very much wider avowed interest. Now, for Bulletin material, convention presentation, and hall-way discussion sigmoidoscopy, peritoneoscopy and choledochoscopy become acceptable subjects.

The constitutional change was voted in unanimously, yet afterwards I heard some expressions of uncertainty. The main problem seemed to be worry that the change might mean a retreat from the patient and his disease, with a switch now to emphasis on technic, instruments, optics, volts and suction machines. After all, we spent considerable time during the past two annual meetings in discussion of light beams, angles of incidence and optical glass. In short, it seemed to some that we had extended our purpose wholly on the basis of methodology, that our instruments were being acknowledged as more interesting than our patients' pathologic problems.

Other members seemed upset over the mere fact that the stomach must now be de-emphasized. This might become a society of proctologists, perhaps? Or, as one member put it, how much dilution can our Society stand before it becomes just another general gastroenterology association? And, as the most pessimistic attitude, another member supposed that we have finally defeated our excuse for being, by declaring ourselves responsible for just the matters that two other American societies have been dealing with for some time.

There were some other searching comments along these lines, all important, some suddenly coming to mind only after the membership had voted the change in, and some obviously very disturbing to members who have taken special pride in the Society's past accomplishments.

It is, of course, not my purpose to answer these objections, but I think it should be emphasized that possible implications of the change were thoroughly discussed for three years prior to the vote—by the membership during our business meetings, by the Governing Board during its meetings, and by the framers of the new constitution. The change was made with eyes open and with the realization that the content of the Bulletin and annual convention is going to follow whatever line the interests of the membership dictate, now simply with a wider field of choice—and it will be the most actively participating members who will be making the decision.

EDDY D. PALMER
Colonel, MC

A Report from the Retiring Secretary-Treasurer

With a Review of 1958 - 1961

A. M. Olsen, M.D.

It has been my privilege to serve as Secretary-Treasurer of the American Gastroscopic Society for the past three years. I was elected to this office at our meeting in Washington, D. C. in May, 1958. As most of you will recall, this meeting was held in conjunction with the World Congress of Gastroenterology, and this session was one of our most successful meetings.

The past three years have been most eventful as far as our society is concerned. Following the Washington meeting, it was decided that our bulletin should be more than just a newsletter. Plans were made for publication of the bulletin on a quarterly basis, and for the first time, advertising was accepted for our journal. It was hoped that the articles in the bulletin could be listed in the Index Medicus, and plans were made for distribution of the journal to many libraries, medical schools, etc.

As far as the bulletin is concerned, we have not achieved all of our objectives but a good deal of progress has been made. The resignation of Dr. John Tilden Howard as Chairman of the Editorial Board in the spring of 1959 was a real blow. However, Dr. John Rumball, who succeeded Dr. Howard, has done an exceptional job as Chairman of the Board. Dr. Roy Sexton, who has served as Editor of the Bulletin for many years and who has contributed so much to the success of the bulletin, was forced to resign in the fall of 1960 because of his health. Following Dr. Sexton's resignation we were obliged to suspend publication for a few months. Fortunately, however, the society has secured the services of Dr. Horace Marvin, who has agreed to serve as the new Editor of the Bulletin, with the cooperation of Mr. Ron Stainbrook and our new Secretary-Treasurer, Dr. Frank McGlone. All of us express our gratitude to Dr. Marvin for taking on this assignment and extend to him every good wish for success.

We have continued to have our annual meetings in close continuity with the American Gastroenterologic Association. In 1959, our society had a very successful meeting under the presidency of Dr. J. E. Berk in Atlantic City. In 1960, Dr. C. Wilmer Wirts presided at the annual meeting in New Orleans, which was held in conjunction with a postgraduate course in gastroenterology sponsored by the American College of Physicians. At both the 1959 and 1960 meetings, newer developments in the field of gastroscopic photography were featured, and also the increasing interest of our members in esophagoscopy was emphasized.

Our society met in 1961 in Chicago under the presidency of Dr. Paul Shallenberger. Through the efforts of Dr. Fred Steigmann, an exceptionally fine clinical session was held at the Cook County Hospital, and we had an excellent scientific program at the Drake Hotel, highlighted by a discussion of the physical principles involved in gastroscopy and fiberoptics.

The Rudolf Schindler Award was presented to Dr. Herman J. Moersch in 1959, jointly to Dr. Harry Segal and Dr. Robert Nelson in 1960, and in 1961 to our distinguished colleagues from Paris, Dr. Charles Debray and Dr. Pierre Housset. We were very pleased to have Dr. Housset present at our recent meeting in Chicago, and all of us enjoyed his clinical demonstration and his scientific presentation.

It has been customary for a number of years for the Governing Board to meet in Chicago early in November for its semi-annual business meeting. However, in November, 1960, the Governing Board met in Rochester, Minnesota as the guests of your Secretary-Treasurer. My colleagues in the field of gastroenterology arranged a program of clinical interest to supplement our business sessions. It was a great pleasure for me to be host to the Governing Board of our society.

During the past year, changes in the Constitution and By-Laws have been made which will undoubtedly have a profound effect on the future of our society. The name of the society has been changed to "The American Society for Gastrointestinal Endoscopy." For many years, gastroenterologists have been interested in endoscopic examination of the esophagus, the stomach and the rectum, and sometimes the peritoneal space. Recent developments in the field of fiberoptics are making it possible to examine the duodenum, and it is quite possible that endoscopic techniques may be extended to all portions of the gastrointestinal tract. Although our society is still

(Continued on Page 7)

Apparatus for Intragastric Color Cinematography

By Henry Colcher, M.D., and George M. Katz, M.E.E.
(with the technical assistance of Jerome Meyer)

The recent progress in still color photography through the gastroscope and its usefulness for diagnosis and teaching has been reviewed by Keever and Barborka[1]. Chief among these advances are those made by Schindler; Henning[2]; Segal and Watson[3]; Nelson[4,5] and Debray and Housset[6]. The technical improvements range from photography through the rigid gastroscope with few lenses to photography through the flexible gastroscope; overloading the standard bulb (Segal and Watson); and the introduction of the electronic flash (Debray and Housset).

This report describes experiments in cinematography through the gastroscope. The experimental models developed in our instrument laboratory permit filming at 8 frames per second with a modified reflex 8 mm movie camera.

The term *cinegastroscopy* is suggested to define cinematography through the gastroscope.

No reports of cinematography through the gastroscope could be found in the literature available to us. Since the general experience over the past 35 years with still photography has shown that black and white pictures are of limited value, our efforts were directed to obtain motion pictures in color. A hopeful beginning has been made in this direction.

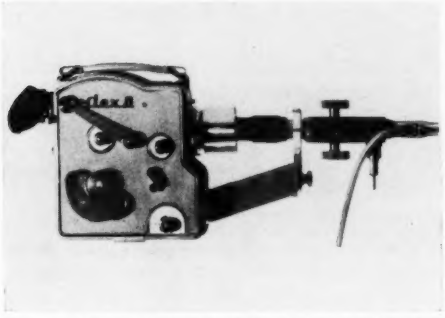

Fig. 1: Models B and C. Gastroscope with reflex camera and light carrier from external source of light for intragastric illumination.

Very high levels of illumination of the interior of the stomach are required in order to permit filming, due to the great loss of light through the lens system of the gastroscope and the relatively short exposure time. At 8 frames per second the exposure time is only approximately 50 milliseconds.

The limiting factor to intragastric illumination is the heat produced by the bulb filament during the gastroscopic examination. To obtain adequate illumination without excessive heat, two possible methods were investigated: external and internal sources of light. With the external source, light is transmitted through a flexible bundle of fiberglass incorporated into the gastroscope. With the internal source, one or two bulbs are placed either distally or proximally to the objective. Pilot models have been constructed and can be classified into four groups: A, B, C and D.

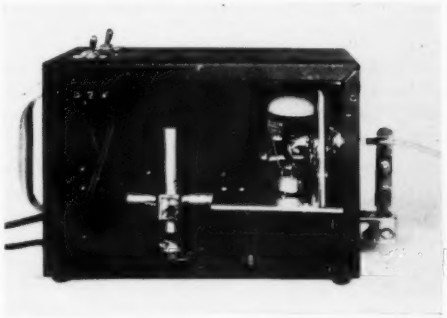

Fig. 2: External source of light for models B and C. Lenses condensing and focusing light onto a bundle of fiberglass.

MODEL A: Internal Light Source.

The light source was left at the distal end of the gastroscope and several types of bulbs were tested at normal ratings and with overload. In order to increase the amount of concentrated light beamed at the area to be filmed, the single distal bulb

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was modified by changing the shape of the glass and the mode of reflection of the light. It was hoped to provide sufficient illumination by decreasing the amount of light wasted by the standard bulb. The resultant improvement was insufficient for filming.

A second bulb was then placed in close proximity to the objective, namely: in the housing of the deflecting mechanism of the

Fig. 3: Distal end of gastroscope with fiberglass bundle and mirror in the housing of the "elevator" of the operating gastroscope.

Benedict operating gastroscope. The beam of light, concentrated and directed by a lens and mirror, was still unsatisfactory.

In these constructions the main difficulty continued to be the excessive heat generated for the amount of light required. Although excellent illumination and good color pictures were obtained at 1/25 second exposures in a stomach phantom, it could not be used in patients.

The electronic flash bulb was tested, and though more efficient than the incandescent

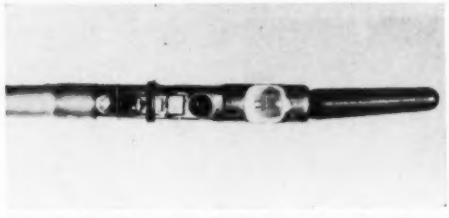

Fig. 4: Simple method of changing the Benedict operating gastroscope into a Taylor type of instrument.

bulb, it still generated excessive heat. For this reason and because such a system presented special problems of isolation and insulation, it was considered unsatisfactory.

MODEL B: Internal plus External Light Sources.

The distal bulb was retained for examination and an additional external source of light was utilized for filming (Fig. 1). This arrangement consisted of a projection bulb (Sylvania Truflector) with lenses condensing the light onto a bundle of fiberglass (Fig. 2). The bundle was introduced into the biopsy lumen of the operating gastroscope and fitted with a mirror arrangement in the housing of the deflecting system (Fig. 3). This method proved adequate for both "in vitro" and "in vivo" filming, using special film supplied by Eastman Kodak.

MODEL C: External Light Source.

The arrangement for the external light source was similar to that of Model B, but the distal bulb was eliminated. This model permitted satisfactory examination and intragastric filming. However, a more intense outside light and adequate cooling were required in order to protect the proximal end of the bundle. In addition, a mechanism for varying the light intensity during filming had to be provided. Nevertheless, this

Fig. 5: Position of the operating gastroscope in a stomach model when modified into a Taylor type instrument (See text and Fig. 4). Note the curve of the gastroscope. The screws and wires belong to the phantom.

model is promising since it obviates the problem of increased intragastric heat. It also allows for the construction of experimental gastroscopes with both side viewing and terminal viewing by eliminating the distal bulb. Methods for safe introduction of such a gastroscope without a rubber finger must still be devised.

MODEL D: Internal Light Source with Intermittent Illumination.

In order to permit the adaptation of existing gastroscopes for color cinematography, techniques are being devised for minimizing the generated heat by using intermittent illumination. This has been achieved by constructing a special power control unit that

permits synchronized bursts of voltage with the camera shutter. Experiments with this type of construction are very encouraging and indicate that all types of existing gastroscopes could be changed into cinegastroscopes.

With the two basic models (B and D), adequate color movies were obtained in six patients, using a modified Camex 8 mm reflex camera with a fixed focus lens. Specifications for the construction of permanent models have been prepared. It is hoped that the makers of gastroscopes will undertake the construction of cinegastroscopes with external illumination (Model C) and the modification of the existing instruments into cinegastroscopes with internal illumination (Model D) additional modifications could be incorporated. One such modification permits the use of the Benedict operating gastroscope as a Taylor type instrument. By fixing the distal portion of the "elevator" system of this gastroscope (Fig. 4) the entire terminal portion can be moved by manipulating the proximal part of the deflecting mechanism. Thus the objective can be brought closer to the angulus

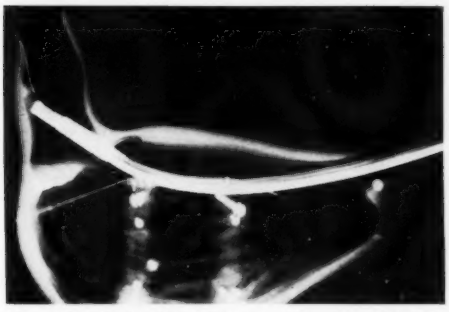

Fig. 6: Introduction of the gastroscope into the antrum by means of a wire fixed in the "duodenum" of the phantom and extending beyond the mouth. The instrument is passed over the wire.

and permit better viewing of the antrum (Fig. 5).

When terminal (end-on) viewing is achieved with the external light source, new techniques will have to be devised in order to incorporate both safety and better guidance of the objective into the center of the antrum. This will be attempted with the transparent balloon construction described previously[7], and with a wire and thread guidance arrangement (Fig. 6) still in the experimental stage. It is hoped that these improvements[8,9] will permit a better visualization of the "blind area" of the lesser curvature of the antrum. Additional benefits from cinegastroscopy can be achieved by changing the mode of preparation of the patient; by proper selection of drugs used for anesthesia and by reduction of secretion while maintaining adequate peristalsis.

"Dr. Pierre Housset from Paris, France, informed me at the Chicago meeting of May, 1961, that he and Dr. Debray have been working for five years with a model similar to model "A". They have encountered the same limiting factors, namely; insufficient illumination and excessive heat, and have therefore limited themselves to short runs of a few seconds at a time."

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SECRETARY-TREASURER REPORT

(Continued from Page 4)

vitally concerned with the endoscopic examination of the stomach, it seems only reasonable that the name of the society should be changed to reflect the diversification of interests among our members.

During the past three years, a total of 38 new members has been elected to our society. Now that the society has changed its name and increased its scope of activities, we expect that there will be an increased interest in membership.

The Chairman of the Membership Committee is Dr. Robert S. Nelson.

The Gastroscopic Diagnosis of Lymphoma of the Stomach

Bernard M. Schuman, M.D.

There is little doubt that lymphoma of the stomach and carcinoma of the stomach are diagnostically inseparable by clinical manifestations. There are criteria for the X-ray diagnosis of gastric sarcoma but most radiologists are rightly reluctant to make an unqualified diagnosis. With the advent of the flexible gastroscope, it was hoped that a confident presurgical diagnosis of primary gastric lymphoma, the most common type of sarcoma in that organ, would be possible. This hope appeared a reality when in 1937, Schindler[1] wrote that the infiltrative type of lymphosarcoma is "characteristic and cannot be mistaken for any other picture . . . ." However, shortly thereafter, Taylor[2] stated in a review of published case reports that there were no gastroscopically diagnostic features of sarcoma of the stomach.

Later, Spencer et al[3], decided, upon analysis of 19 patients, that "sarcoma of the stomach cannot be established by gastroscopic examination alone." Finally, in an extensive review of 124 cases of gastroscopically observed gastric sarcoma reported in the literature to 1950, Palmer[4] concluded that "present day diagnostic techniques, combining clinical, roentgenologic and gastroscopic examination methods, cannot raise the proportion of correct presurgical diagnoses of gastric sarcoma much above the 50 per cent mark. Biopsies taken with the help of the flexible gastroscope and probably cytologic study of gastric contents can be expected to improve results in the future . . . ."

In an evaluation of a case of reticulum cell sarcoma of the stomach, which was diagnosed preoperatively as carcinoma by this gastroscopist, a review of the literature was undertaken to ascertain what the gastroscopic experience with lymphoma of the stomach has been subsequent to 1950, and, in particular, what contribution gastroscopic biopsy had made to the presurgical diagnosis of this tumor.

CASE REPORT

F. W. A. (#405225 U. S. Navy Hospital, Portsmouth, Va.). Having enjoyed good health throughout his military career, this 53-year-old Colonel was somewhat chagrined that he should be troubled by recurrent episodes of dull epigastric discomfort so soon after retirement. During 1957 and 1958, he noted an increasingly more frequent and persistent postcibal upper abdominal sensation of "gas under pressure" associated with nausea. Because of a weight loss of 30 pounds, he sought medical advice. After a negative upper gastrointestinal series in February 1959 (Fig. 1), he was told to reduce his smoking. Although he regained

Fig. 1: Upper G. I. Series of February 1959, Demonstrating Normal Antrum and Duodenum.

20 lbs., he continued to have epigastric distress after meals. He was hospitalized in June 1959 but, after extensive study, no physical, laboratory or radiologic abnormality was detected. In the few weeks following discharge, the patient noted frequent nocturnal epigastric pain, which radiated into the left infrascapular area, and sporadic postprandial vomiting. On July 7, 1959, a second upper gastrointestinal series showed "residual gastric content . . . (and) the presence of a large polypoid lesion in the antrum that appears to arise from the greater curve" (Fig. 2).

On July 8th gastroscopy was performed with the flexible operating gastroscope after approximately 200 cc. of thick brown fluid had been drained from the stomach. With the instrument at full length, a white mass immediately came into view. The angulus could not be identified, being obscured by the tumor. The pylorus was not seen, but what was believed to be a normal antral mucosal pattern was observed distal to the tumor. The mass was best visualized along the greater curvature of the antrum and

distal third of the body of the stomach. It was somewhat hemispherical in contour and the proximal border gradually blended into the surrounding thickened gastric rugae. The mucosa appeared intact over the tumor and

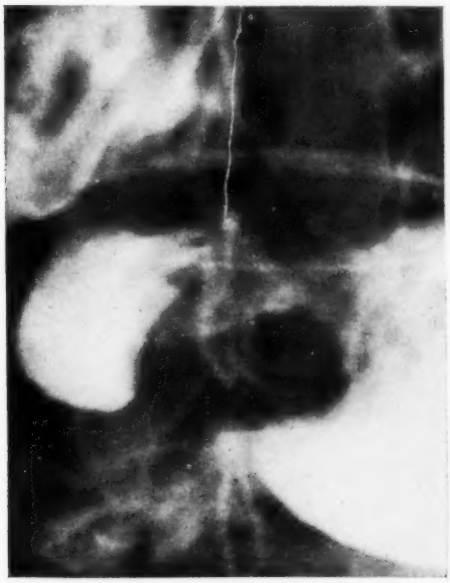

Fig. 2: Upper G. I. Series July 1959, Showing Large Defect of Greater Curvature of Antrum.

was shiny white and gelatinous, although distorted by several underlying discrete flattened mounds, 1-2 cm. in diameter. Three biopsies were taken under direct vision through the instrument. The gastroscopic diagnosis was antral carcinoma. Multiple sections of the biopsy material were interpreted by the pathologist as showing normal gastric mucosa (Fig. 3).

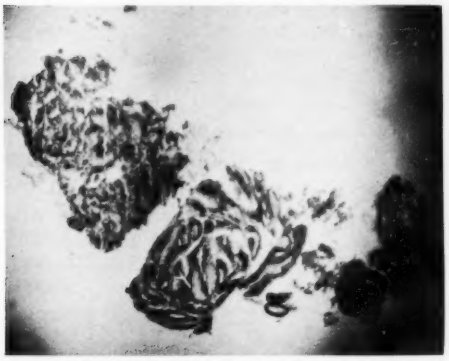

Fig. 3: Fragments of Gastric Mucosa Obtained by Gastroscopic Biopsy.

On July 14, 1959, an 80 per cent subtotal gastric resection with excision of the omentum, tail of the pancreas and spleen was performed. The stomach was not opened for biopsy and several lymph nodes taken for frozen section were negative for tumor.

The appearance of the resected tumor was not unlike that seen gastroscopically. There was grossly uninvolved stomach at the distal antrum and pylorus and proximal half of the body of the stomach. However, at the pyloric end of the tumor there was an irregular shallow depression measuring approximately 6 by 3 cm. surrounded by a heaped-up border. The area of depression did not appear denuded. Microscopically, a mass of tumor cells was seen predominantly in the submucosal plane (Fig. 4), except in

Fig. 4: Postoperative Section Demonstrating Mass of Tumor Cells in Submucosal Plane.

sections through the area of tumor depression where there was marked infiltration of the lamina propia completely eradicating the normal glandular pattern of the mucosa. The pathologic diagnosis was reticulum cell sarcoma of the stomach.

The patient's postoperative course was uneventful. He received one thousand roentgens to the site of surgery. He has remained

well and is without evidence of tumor recurrence locally or systemically.

COMMENTARY

The gastroscopic features noted above, namely, a large tumor with polypoid nodules under an intact mucosa covered by a white gelatinous exudate, are recorded in the early papers. Yarnis and Colp[5] mention that "the marked exaggeration of the rugae with ridgelike elevations and polypoid formation and the presence of nodular tumors of varying size covered by relatively normal mucous membrane . . . are rather characteristic." Again, "polypoid submucous tumors covered by relatively normal mucous membrane, diffuse infiltrative lesions covered by an adherent layer of white gelatinous secretion should suggest gastric sarcoma . . ."[5] Snoddy's[6] study of 34 lymphomata of the stomach included the observation that "some of the rugae had prominences suggesting polypi . . ."

However, the gastroscopic recognition of lymphoma has been infrequently recorded since 1950. The reasons for this are two. First, there is a low index of suspicion because of the relative rarity of the tumor. And secondly, although there are rather characteristic features, none are specific. In their study of 15 cases of stomach lymphoma, Lame et al[7], found that "the gross operative diagnosis per se, like the radiologic or gastroscopic, is unreliable." Crile[8] concurs with the opinion that the gross diagnosis in the operating room is undependable. A. P. Stout[9] claimed that gastric lymphoma can imitate all of the different gross carcinoma types and that the only way in which lymphoma may differ from carcinoma is that, should ulceration occur, it is usually multiple in the former. If the gross operative appearance offers no diagnostic clue to an experienced surgeon and pathologist, little can be expected of the gastroscopist. Of 57 gastroscopic and four esophagoscopic examinations of 152 cases of proven lymphoma of the stomach reported in the last ten years (but including cases of earlier years), a presurgical endoscopic diagnosis of lymphoma was made only nine times. (Table 1: 10, 11, 12, 8, 13, 14, 15, 16.) It would appear that the gastroscopist must be satisfied to recognize "malignant growth" and defer to biopsy for definitive diagnosis.

Seven cases of lymphoma of the stomach biopsied through the flexible gastroscope were found in the literature. Schallenberger[17] described a patient who had a gastric ulcer in association with lymphosarcoma of the lung. Biopsy of the ulcer edge showed round cell infiltration and the possibility of lymphoma was raised; but the ulcer healed under medical therapy and did not recur. In his original series of 63 gastroscopic biopsies, Benedict[11] reported two cases of lymphoma. The first was thought to be carcinoma endoscopically, but proved to be sarcoma by biopsy. The second presented the gross appearance of lymphoma but the biopsy was interpreted as an undifferentiated carcinoma. This second tumor was later shown to be Hodgkin's sarcoma.

A known case of systemic Hodgkin's disease in which gastric involvement was demonstrated by gastroscopic biopsy was subsequently reported by Benedict[14]. Wirts'[12] experience included three cases of lymphoma, none of which was recognized as such gastroscopically (Table 1). One was proven to be sarcoma by biopsy, but the microscopic sections of the other two were interpreted as gastritis. Thus the early observation[15] that "a gastroscopic biopsy that does not demonstrate lymphoma may exclude lymphoma with reasonable certainty, because this growth is usually regarded as a diffuse process" is untenable. That it is so is not the fault of the biopsy technique, but rather

GASTROSCOPIC DIAGNOSIS

Author	Cases	Gastroscopies	Lymphoma	Carcinoma or Malignancy	Malignant or Benign Ulcer	Gastritis	Not Seen
Kushlan, 1950[10]	1	1	0	0	0	0	0
Benedict, 1950[11]	2	2	1	1	0	0	0
Wirts, 1951[12]	3	3	0	0	2M	1	0
Crile, 1952[8]	19	9	1	8	0	0	0
Palmer, 1957[13]	14	16*	0	8	2B	0	6
Benedict, 1957[14]	1	1	1	0	0	0	0
Thorbjarnarson, 1959[15]	37	9	0	7	1B	0	1
Friedman, 1959[16]	75	16	6**	12	2M	0	0

Table 1. Analysis of 57 gastroscopic diagnoses made in 152 cases of lymphoma of the stomach reported since 1950.

*The 16 gastroscopic examinations were made in a series of 21 gastric sarcomas and it was not indicated how many of the 14 lymphomas of the series were gastroscoped.

**Four diagnoses were established by esophagoscopy, but it is not indicated how many of the diagnosed lymphomas were visualized by esophagoscopy alone.

the essential pathologic nature of the gastric lymphoma. Stout[9] stated as a generalization that lymphoma of the stomach, most of which he believed was reticulum cell sarcoma, grows in a great solid mass, "covered by intact mucosa" until erosion eventually removes the mucosa.

Other authors[2,6] concluded that the tumor arises in the submucosa, spreading out in that tissue plane and ultimately involving the lamina propia. Friedman[16] also considered the process basically submucosal, so that the primary manifestations were a thickened wall and prominent gastric rugae, with mucosal alteration being a late manifestation. In Wirts'[12] second case where multiple biopsies of the ulcer border were taken and were pathologically interpreted as gastritis, necropsy demonstrated a lymphoma which was essentially submucosal. Therefore, one should not anticipate uniform success with gastroscopic mucosal biopsy. Moreover, it is unlikely that this basic obstacle to positive tissue diagnosis can be overcome, for to biopsy into the ulcer bed or into the submucosal layer would increase significantly the hazard of the procedure.

A preoperative tissue diagnosis of lymphoma of the stomach is of more than academic interest. As in the case reported here, the nature of the surgical procedure and, therefore, the degree of risk, depend on exact information as to the cellular nature of the tumor. A malignancy amenable to X-ray therapy does not require radical surgery with its attendant increased hazard, since good results in gastric lymphoma have been achieved with conservative surgery plus irradiation.[15,16] Since the gross tumor cannot with certainty be recognized in the operating room and since, by frozen section, "reticulum cell sarcoma, for example, may be impossible to differentiate from anaplastic carcinoma . . ."[7] the gastroscopist must provide the preoperative tissue diagnosis if a proper therapeutic program and, in particular, a reasonable surgical procedure are to be planned.

SUMMARY

A report of a case of primary reticulum cell sarcoma of the stomach is presented. The gastroscopist failed to recognize the true nature of the tumor and the gastroscopic biopsy did not demonstrate malignant change.

Analysis of the literature indicates that gastroscopic visualization is an inadequate basis on which to infer the cellular type of a malignant growth.

Biopsy through the flexible operating gastroscope is the best available method of establishing the diagnosis of gastric lymphoma, but the nature of the tumor is such that it is not readily accessible to mucosal biopsy, particularly as an early growth.

It is incumbent upon the gastroscopist to make every effort to provide a pathologic diagnosis so that appropriate therapy may be planned.

I wish to thank Capt. A. V. Holmes, M.C., U.S.N., for his invaluable help.

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Biopsy of the Esophagus and Stomach

Technic and Evaluation

By Eddy D. Palmer, Colonel, MC*

Improved endoscopic effectiveness has not lessened the desirability of biopsy study in practical esophagogastric diagnoses. In fact, it has increased the need for histopathologic information in certain investigational fields. There has been nothing especially new during the past couple of years in technics available for taking biopsy specimens from the esophagus or stomach but there have been advances in the understanding of the potentialities of well-known technics.

ESOPHAGUS

It is unlikely that there will ever be a more certain and practicable means of taking esophageal biopsy specimens than the classical one of transesophagoscopic punch. The feature of precise direct-vision manipulation is the most important of its advantages. Although it is quite possible to perforate the esophagus by this technic, such accidents are extremely rare.

There is no need to discuss equipment or technic before this group. It is worth mentioning, however, that when the patient has severe kyphosis or other anatomic deformity which precludes esophagoscopy, blind biopsy technics (as by vacuum tube) must be abandoned in favor of cytologic study or perhaps thoracotomy. It is believed that blind biopsy technics can rarely be considered to have a place in esophageal study. The possible presence of unsuspected varices is a sufficient argument against this method.

However, the best technic, transesophagoscopic biopsy, is not without its mechanical and interpretational frailties. The main error lies in an occasional case of esophageal carcinoma in which apparently accurately directed biopsy forceps fail to obtain diagnostic material. Rarely, two or three biopsy efforts fail to include cancer tissue. There are three explanations. First, the forceps may not have been as accurately directed as the operator thought. Second, the tumor may produce so much esophageal narrowing by proximal submucosal extension that it is not possible to get the forceps down to exposed tumor. Third, occasionally normal mucosa is pushed proximally as a shelf before expanding tumor growth, so that it appears endoscopically to be tumor and is handily biopsied.

STOMACH

Both blind (vacuum tube) and gastroscopically-directed biopsy technics continue to have their advocates and to demonstrate both clinical and investigational usefulness. The two technics have caused a rather distinct cleavage among those interested. The direct technic, with gastroscopic control, has an obvious theoretical advantage which, experience has shown, can often be realized in practice. As with so many medical technics, it has worked for those who have approached it with enthusiasm and given it a fair chance by taking the trouble to learn and to earnestly work at the procedure. For others it has proved a technical disappointment.

The problem with direct gastroscopic biopsy, according to many gastroscopists, is that only occasionally can the specimen be taken from the desired site, and that the antrum cannot be reached at all. Then, too, the specimen is very small. To repeat, with practice and enthusiasm, accurate direction of the forceps appears to become a minor problem and the small size of the specimen becomes of less consequence. The method appears to be quite safe. However on a few occasions, the operator has been dismayed to find that he could not withdraw the projecting biopsy forceps, necessitating emergency laparotomy, gastrotomy, and amputation of the forceps before the gastroscope could be withdrawn.

Blind gastric mucosal biopsy with the Wood vacuum tube is remarkably easy, safe, fast and requires no practice immediately to obtain excellent specimens. But it is a blind technic and, therefore, its clinical usefulness is largely limited to diffuse mucosal disease. When biopsy is needed most—for evaluation of possibly malignant lesions—the vacuum tube can only prove helpful through fortunate positioning.

There are, nevertheless, some clinical situations which make blind biopsy useful,

*From the Gastroenterology Service, Brooke General Hospital, Fort Sam Houston, Texas. Presented at Annual Meeting, The American Gastroscopic Society, New Orleans, La., March 30, 1960.

in addition to its value in investigation. There is no question but that chronic gastritis is best diagnosed histopathologically. And, because idiopathic gastritis appears in almost all cases to be a generalized process, the vacuum tube is the best method to obtain tissue for diagnosis. An important specific use in this connection is diagnostic confirmation in the alleged pernicious anemia patient who has been under adequate treatment elsewhere. The atrophic gastritis of pernicious anemia does not improve with treatment of the underlying disease but continues to show a characteristic histopathologic picture.

Histopathologic material to confirm the diagnosis of hemochromatosis is conveniently obtained by blind gastric mucosal biopsy. This is quicker, safer and just as certain as liver biopsy. Other generalized diseases whose diagnosis can be helped by mucosal biopsy include sarcoidosis and secondary amyloidosis.

Gastroscopic Blind Areas

An Instrument Evaluation

By Harry Barowsky, M.D.*

One of the major handicaps that confronts the gastroscopist is his inability to visualize certain areas of the gastric mucosa. These regions are termed "blind spots." They are well known to the endoscopist and need only be enumerated here. They are situated in the following areas: (1) The lesser curvature in the prepyloric region; (2) A small portion of the greater curvature where the tip of the instrument rests; (3) The fundus, since it is a recessed part of the stomach; (4) The major part of the posterior wall; (5) The esophagogastric junction and cardia.

The "mucus lake" blind area is not included in this study since it is variable. Adequate removal of gastric secretions with changes in the position of the patient usually improves visualization of this region. Numerous attempts have been made by clinicians to overcome the hinderance of "blind spots." Some [1,2,3] have suggested that changing the position of the patient during the examination may be helpful. Moersch[4] recommended manipulation of the abdomen during gastroscopy. However, these procedures have not materially overcome this difficulty.

It remained for instrument makers, collaborating with physicians, to devise special modalities for this purpose. In addition to the standard Schindler gastroscope, three additional instruments have been developed, each having some modification which is claimed to improve visualization of the "blind areas." One of these was the "omniangle" gastroscope. The claim is made that this instrument increases the range of vision. Another was the introduction of a "controlled movable tip." Taylor[5] initiated such an improvement in 1941. Later, in 1949, Chamberlin[6] further modified it so that some of the hazards encountered in the Taylor instrument were eliminated. Finally, the most recent improvement in the gastroscope was made by Bernstein, Fruin and Gornett[7]. They recognized that the posterior gastric wall and cardia were not visualized when the light source and objective are in contact with the mucosa. Thus they concluded it was due to poor illumination. By bringing "the light and lense mirror system together," illumination of the contacted mucosa is achieved and visualization attained.

Since there is no definite knowledge as to the efficacy of these improvements, a comparative evaluation of their ability to visualize the "blind areas" was made.

METHOD OF STUDY

Each patient was exposed to the usual preparations of sedation, surface anesthesia and gastric evacuation. Individuals were observed with four different gastroscopes. The types employed were the standard (Schlindler) which was used as a control; the omniangle (Cameron); the controlled movable tip (Chamberlin) and the contact vision (Bernstein). Each gastroscope was used at least one hundred times so that four hundred gastroscopic studies were made. Only those cases in which the examination was satisfactory, were included. Those cases where only partial examinations were made or where there was too much gastric secretion were discarded.

Careful observations of all the "blind areas" were made and the extent of visualization was tabulated in percent. Each blind area was given a "zero" rating when less

*Associate Professor of Medicine, New York Medical College.

A COMPARATIVE EVALUATION of the ABILITY of VARIOUS GASTROSCOPES to VISUALIZE the "BLIND AREAS" in 100 CASES

Number of Cases Expressed in %

TYPE of GASTROSCOPE	Prepyloric	Greater Curvature	Fundus	Posterior Wall	Esophagogastric Junction & Cardia
Standard (Schindler)	0	0	0	4.5	2
Omniangle	1	0	0	6	4.5
Controlled Angulation Tip (Chamberlin)	1.5	33.5	6	32.5	5
Contact Vision (Bernstein Head)	0	0	1	85	91.5

than half of it was observed; "one half", if half to three fourths was seen and "one" if more than three fourths was visible. These criteria are approximate since in the prepyloric, fundal and greater curvature areas, difficulty in determining the exact extent of visualization was encountered.

RESULTS (See Chart)

The study is interesting since there is a marked difference in the visualization each modality makes in a given blind area.

All the gastroscopes failed to visualize the prepyloric area except for one and one half percent with the Chamberlin and one percent with the omniangle instruments. All instruments, except the Chamberlin, did not visualize the greater curvature "blind area." The latter was able to visualize 33½ percent of the cases. The fundus was observed in only six percent of the patients with the Chamberlin and in one percent with the contact vision (Bernstein) type. The other instruments failed entirely. A marked improvement was obtained (85%) in visualization of the posterior wall with the Bernstein modality. Good results were obtained in 32½% with the Chamberlin; six percent with the omniangle and four and one half percent with the standard varieties. Finally, remarkably good results (91½%) was achieved by the Bernstein instrument in the observation of the esophagogastric junction and cardia. On the other hand, the combined positive results attained with the other three gastroscopes were only eleven and one half percent.

COMMENT AND SUMMARY

Although the findings of this study must be considered approximate, it is extremely informative. It must be conceded that the extent of visualization of some of the "blind area" was difficult to determine. This was especially true of the prepyloric, fundal and greater curvature areas. However, there was marked limitation of vision of these regions with all gastroscopes, except for the Chamberlin instrument, which is helpful in partial visualization of the greater curvature. This leaves no doubt that there is a great need to improve the mechanics for visualization of these important regions.

On the other hand, when compared to the standard gastroscope, a remarkable improvement has been achieved by the contact vision (Bernstein) instrument in visualizing the extensive "blind areas" of the posterior wall, esophagogastric junction and cardia.

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ABSTRACT

Schultz, E. N., Hauch, E. W., et al.
Gastroscopy—in a large general hospital
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The gastroscopic experience in the Los Angeles County General Hospital for the period from 1951 to 1956 is compared with that reported from the same institution for the period from 1943 to 1948. In the second 5-year period there were 472 successful gastroscopies; in addition, 72 attempts (13%) were unsuccessful. For the earlier period, 519 examinations were reported.

In the second 5-year period the incidence of normal gastroscopic findings increased, while the incidence of atrophic and of superficial gastritis decreased, the total of normal findings plus all gastritides remaining about the same. The incidence of benign ulcers, polyps, malignancies, and hypertrophic gastritis also remained about the same.

In the second 5-year period, of 14 polyps seen gastroscopically only 7 were evident on roentgenograms. Of 38 benign ulcers found at operation, all were diagnosed either radiographically or by gastroscopy; gastroscopy was somewhat more accurate, but the tables are unclear. The error of calling benign ulcers malignant was eight times more common than the converse, while in the first series the same error was only twice as common as the converse. Of 60 malignancies confirmed after surgery or necropsy, all were correctly diagnosed radiographically or by gastroscopy; again gastroscopy was slightly more accurate, but the tables are not too clear.

Francis J. Owens, M.D.

The Application of Exfoliative Cytology to Benign and Malignant Diseases of the Esophagus and Stomach

Howard F. Raskin, M.D.
Joseph B. Kirsner, M.D.

Esophageal and gastric exfoliative cytologic examinations are not difficult to perform and are of great diagnostic importance. Considering that methods have been available for nearly a decade, the relative lack of use of these accurate procedures is indeed disappointing. During this same period, the introduction of the flexible esophagoscope, improvements in the optics and the construction of the gastroscope have stimulated renewed interest in gastrointestinal endoscopy. It is somewhat paradoxical that gastroscopy should be promoted and not exfoliative cytology, since endoscopy rarely uncovers a malignancy which x-ray failed to disclose. Moreover, cytology is truly the more decisive diagnostic procedure.

It is not our intention to review the subject or to repeat the descriptions of methods for lavaging the esophagus and stomach. Despite the emphasis upon gastric brushes, abrasive balloons, mucolytic enzymes and other methods of enticing malignant cells from the parent tumor, such methods are cumbersome, uncomfortable, occasionally hazardous and, most important, do not equal the diagnostic accuracy of the lavage method.

Why do malignant cells, in particular, tend to exfoliate? If one thinks of squamous cell carcinoma of the esophagus and adenocarcinoma of the stomach as actively growing epithelial tumors with younger subsurface malignant cells literally pushing those above on to the surface, then perhaps "crowding" plays a part in the process of exfoliation. Infection and decreased vascularization of the tumor enhance exfoliation. The calcium content of the "intercellular cement" is decreased in carcinomas, rendering the tumor more friable. At any rate, micromanipulative techniques have demonstrated that fewer micro-dynes of force are required to tease apart malignant cells than cells of normal parent epithelium.

The question then arises: What is the **best** method for accelerating exfoliation? The simple Levine tube works quite well in the esophagus because at no time is the carcinoma farther than a few millimeters from the openings of the lavage tube. Therefore, the full force of the jet of water will, almost by necessity, strike the surface of the tumor. The success of the esophageal lavage is not a question of whether the Levine tube will reach the area of the tumor, because in almost every instance, a number 18 tube can be insinuated past the lesion to reach the cardioesophageal junction. The basic problem, not only in the esophageal wash but also in the gastric lavage, is what happens when the distal end of the tube reaches the site of the tumor. Success is directly proportional to the initiative and determination of the cyto-technician.

The suspicious area in the esophagus can be located quickly, as the area of narrowing and the dilatation of the esophagus above the lesion tend to retain the lavage solution longer than the immediate normal area below the tumor. Therefore, the lavage should be performed thoroughly and intensively, even forcefully, in both injecting and aspirating the saline solution. Forty cc. of solution are injected, not with a rubber bulb but with a tight fitting 100 cc. glass syringe, so that the solution can be forced against the esophageal wall. Immediately, almost before the entire solution has left the syringe, the cyto-technician withdraws the plunger vigorously, to collect the injected water before it passes into the stomach. Tiny fragments of mucosa will be sucked into the holes of the tube. Blood-tinged aspirate is desirable. Successful esophageal lavage is dependent upon attention to small details.

The same principles apply in obtaining malignant gastric cells. The surface area of the fully distended stomach is quite large. The lavage should be performed in such a

From the Department of Medicine, University of Chicago, Chicago, Illinois.

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way that the solution comes in contact with the entire mucosa. The customary approach has been to fill the stomach with 500 cc. of isotonic fluid and then have the patient lie two minutes each on his right and left sides, back and abdomen. The flattening of the rugal folds and the movement of the solution will tend to enhance exfoliation. On the other hand, with a rotating brush or abrasive balloon, the carcinoma may be but a centimeter or two away from the instrument but partially covered by normal rugal folds and, therefore, will not come into contact with the abrasive. Such mechanical devices must be introduced by a physician, whereas the simple gastric lavage is adequately performed by a cytotechnician. The balloon and the brush techniques are uncomfortable and long strips of gastric mucosa have been avulsed with the brush. In more than 1,300 gastric lavages in our laboratory, no complications have been encountered. Exfoliative cytology, basically, is a study of the individual cell or a few clumps of cells. The material collected by abrasive techniques often represents segments of the mucosa several cell layers thick. Occasionally, interpretation is difficult because the individual cells are less distinct.

The major reason for failure in gastric exfoliative cytology is the failure to vigorously barbotage the stomach. Although it has been repeatedly stressed that the stomach is not a delicate organ, as evidenced by the daily abuse received from rapid eating and overindulgence in diet, drink and drugs, the most delicate sort of lavage often is undertaken in the search for cancer cells. One such ineffective technique is the slow instillation of the saline solution into the stomach through an Ewald tube; the solution gently trickles into the stomach, and could hardly be expected to remove the overlying mucous membrane and debris from the carcinoma beneath. Several hundred cc. of air should be introduced into the stomach, in addition to the saline solution, with a 100 cc. syringe. The material should be continually aspirated and reinjected, with the tip of the Levine tube moving from cardia to antrum and back again; the more turbulence and activity produced in the stomach, the more abundant will be the exfoliation of malignant cells.

Mucolytic enzymes such as papain and chymotrypsin have been advocated as enhancing exfoliation. Papain is now rarely used, as it may, by chemical action, render malignant cells unidentifiable. Chymotrypsin, likewise, was intended to digest the overlying protective coat of mucus; but it is absolutely inert in the pH range of 5.5 to 7.0 required for gastric lavage. Chymotrypsin, per se, has not been responsible for the increased cytologic accuracy; rather, the thoroughness of the lavage and the skill of the cytologist in interpreting the exfoliated material have been the decisive factors.

The forceful injection of solution into the stomach is so important, in our experience, that we have developed a pump which delivers 500 cc. of irrigating solution into the stomach in eight seconds. Most patients do not even experience a sensation of rapid filling or fullness. A specially constructed plastic tube containing twenty one-millimeter openings at the distal end, so that the escaping solution will consist of multiple penetrating jets, is used with the pump. A thin guide wire transversing the entire length of the tube allows the cytotechnician to angulate the tip sufficiently so that during introduction the instrument will slide along the lesser curvature of the stomach into the antrum. The distal end of the tube contains a small magnet, so the location of the tip can be ascertained without the use of fluoroscopy, by placing a compass at different locations on the anterior abdominal wall. Such elaborate equipment is not necessary for obtaining excellent results, but it expresses a concern for developing a most effective lavage.

Esophageal carcinoma is relatively simple to diagnose by exfoliative cytology. This laboratory has correctly diagnosed 68 of 72 patients with tumors of the esophagus. Two of the four undiagnosed carcinomas were adenocarcinomas which had infiltrated the submucosa but had barely reached the surface. One hundred three patients with benign disease of the esophagus have had 129 negative esophageal lavages. An erroneous interpretation of malignancy was made in only one instance, a patient with severe esophagitis.

One hundred seventy-two individuals with proven neoplasms of the stomach have had gastric cytology. Malignant cells were recovered and properly identified in 152 instances. Of this group, 143 were adenocarcinomas; 7 were lymphosarcomas and 2

were reticulum cell sarcomas. Thirteen adenocarcinomas, three reticulum cell sarcomas, two Hodgkin's disease, one lymphosarcoma and one leiomyosarcoma either failed to exfoliate recognizable cells or did so but were not initially identified by the examiners. There were five cases of linitis plastica with no evidence of mucosal penetration in the resected specimen or at autopsy. Exfoliative cytology probably will always fail in recognizing linitis plastica unless there is at least one focal point of extension to the surface.

Eight hundred eighty-three patients with proven benign conditions of the stomach have had 1,107 cytologic examinations in this laboratory. In many instances x-ray and gastroscopic evidence were highly suspicious of carcinoma. In all but four instances, the cytologic report was negative for malignant cells, a diagnosis uniformly corrobrated by subsequent study and by the course of the patient. A healing gastric ulcer, an atrophic gastritis and two instances of duodenal ulcer were the final clinical impressions in four patients with false positive results.

Certain specific diseases can be recognized cytologically, but not uniformly. Occasionally, abnormal cells of esophagitis, hypertrophic gastritis of the fundus, gastric atrophy, pernicious anemia in relapse and remission, granulomas of the stomach associated with sarcoid and regional enteritis, and benign papillomas and polyps of the stomach are recognizable. Some of these cellular changes occur infrequently, some rarely but, when present, they are indeed helpful in identifying the disease process.

These technical considerations in the performance of gastrointestinal exfoliative cytology, though seemingly minor, pay large dividends in diagnostic accuracy. Combined with interest in the methods and sufficient care in the interpretation, they help make the exfoliative cytologic procedure the most accurate clinical method for both identifying and excluding the presence of malignant disease from the upper digestive tract.

ABSTRACT

Sullivan, B. H. and Myers, J. E.

Gastroscopy and esophagoscopy: analysis of 1,752 procedures

Med. Annals District of Columbia * 28 (8) Aug. 1959, p. 442-46

The authors present an analysis of 892 gastroscopies and 860 esophagoscopies performed during the past six years. The most frequent diagnosis made by gastroscopy was gastritis; the most frequent diagnosis made by esophagoscopy was esophageal varices. Approximately one-third of both procedures revealed no abnormality. Gastroscopy was unsuccessful twice as often as esophagoscopy. In an unselected group of patients with cirrhosis, esophageal varices were discovered by means of esophagoscopy in 63 per cent, and in only 14 per cent by roentgenologic examination.

There were only three complications in the course of 1,752 procedures, all of which were perforations and occurred during esophagoscopy. Only one complication resulted in significant morbidity. The over-all complication rate was 0.16 per cent.

The authors list the following as indications for gastroscopic examination: 1. Upper gastrointestinal hemorrhage when the source is not definitely known. 2. Gastric ulcer, for aid in distinguishing benignity from malignancy and to evaluate the healing process. 3. Radiographic abnormalities of questionable nature in the stomach. 4. Symptoms referrable to the upper gastrointestinal tract when radiographic studies indicate no abnormality. (Gastroscopy may reveal unsuspected disease or gastritis.)

The following are the indications given for esophagoscopy: 1. Hemorrhage from the upper gastrointestinal tract when the source is not specifically known. 2. Dysphagia or other symptoms referrable to swallowing or to the esophagus. 3. Presence of hepatic cirrhosis or evidence suggestive of portal hypertension. 4. Hiatus hernia with symptoms. 5. Any evidence of esophageal obstruction.

Hugo C. Moeller, M.D.

The Sippy Method of Esophageal Dilatation: A Re-evaluation

Marie Ortmayer, M.D.
5461 So. Sherman, Littleton, Colorado.
Lecturer: Dept. of Medicine, Univ. of Colorado Medical School.

The "medical" therapy of esophageal strictures formed a part of the program of the annual 1960 meeting of the American Gastroscopic Society in New Orleans. Several methods of handling strictures with bougies, mercury bag or water pressure dilation were presented by experienced internists.

It seems fitting at this time to describe the instruments and method of dilating esophageal strictures devised by Dr. B. W. Sippy of Chicago in the early nineteen hundreds, because the method has proved safe and practical in the hands of physicians who were taught by him or his followers. The Sippy method differs chiefly from the methods of dilating over a string guide by using a more stabilized wire guide that is threaded onto the string through an eye and is thus passed to a point below the stricture. The dilating olives are then pushed along the wire through the stricture.

The dilating set contains the following items:

1. A nylon thread (No. 0, 1 or No. 00) of 10 yards or more in length on a spool which will readily unroll as the swallowed string advances along the G. I. tract.
2. A piano wire "guide" (160 cm. long) through the eye of which the string is threaded (adult and child sizes available). . . . (See Fig. 1A.)
3. A set of dilating metal olives that slip onto this wire. 34 adult sizes: 18 to 51 French scale. . . . (Fig. 1B.) 19 child sizes: 10 to 28 French scale. . . . (Fig. 1C.)
4. A flexible coiled spiral wire (55 cm. long) (adult and child sizes) which also slips onto the guide wire and serves as a "pusher" to advance the wedge of dilating olives. . . . (See Fig. 1X.)

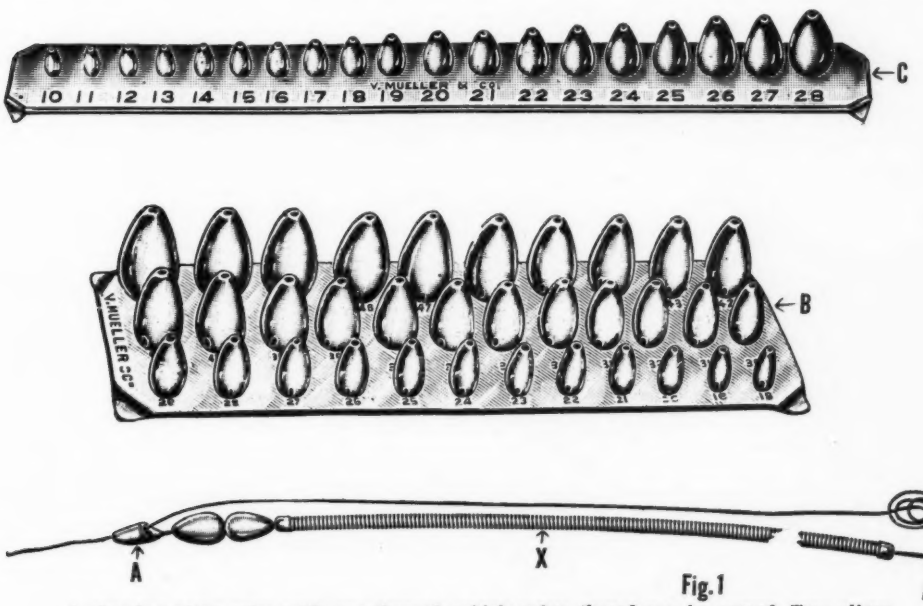

Fig. 1

A showing piano wire with eye through which nylon thread can be passed. Two olives (second reversed) are shown on the wire with coiled spiral wire (x) which serves as a pusher to advance the dilating olives.

B shows the olive set (adult sizes 18 to 51 French).

C shows the olive set (child sizes 10 to 28 French).

Fig. 2

Bougie, of pliable whalebone, which measures distance of stricture from upper incisors (marked with adhesive strip at x) and to which olives can be attached (at o the olive that just passes through the stricture is seen).

5. A six-inch straight hemostat.
6. A wash basin type bowl, which the patient holds in his lap during dilation to catch any regurgitated secretions.

Preliminary to instrumental dilation, it must be determined by history, X-ray and esophagoscopy in adequate combination that an esophageal obstruction exists which is suitable for this procedure. By whale-bone bougie (length 55 cm.) to which an olive has been attached, not only the distance of the esophageal stricture from the upper incisors is determined (see x on Fig. 2), but also the size of the olive which can just be passed through the narrowed area without pressure (see o on Fig. 2). If the patient is able to swallow sips of water without regurgitation, step one can begin.

STEP ONE

The nylon "string" may be impregnated smoothly, in advance, with paraffin to prevent knot formation. To accomplish this it is laid in warmed liquified paraffin and hung up to dry before it is rolled smoothly on a spool, to be carried in the patient's vest pocket or pinned to her gown. Knots, when large, may prevent passage of wire along it and one must then delay until they progress lower into the G. I. tract. Delay occurs in all methods of dilation using a swallowed string guide if knots are impassible.

The guide wire, after the nylon thread has been threaded through the eye of the wire, is being passed downwards along the tautly held thread. The dilating olives are hidden by the operator's left arm, but the coiled pusher is shown held in place by the hemostat "a" and off the floor by an assistant.

To the end of the nylon thread a small lead sinker, an empty capsule or a pancreatic enzyme tablet is attached and is started down by the patient with small swallows of water. Once past the cricoid narrowing, peristalsis carries it along with very little effort of swallowing. The patient soon learns to allow just enough slack between spool and mouth for gradual advance of the string in the G. I. tract. During chewing or intake of semi-solid food, the string is best kept rather taut to prevent knot formation. Usually 48 to 72 hours, rarely longer, are required before it is well anchored in the gut so that it cannot be dislodged upwards by pulling on it. The degree of "tug" which indicates good anchorage is soon learned by the operator. The patient returns—**fasting**—on the day of dilation. A topical throat anesthetic minimizes gagging and discomfort.

STEP TWO

Preparation of the dilating wedge of olives and coiled spiral wire "pusher" on the piano wire guide is as follows:

a. 3 (sometimes 5) olives are selected to form a wedge. The olive which has previously been found to pass through the stricture leads. Next the olive just larger is threaded onto the wire. Then an olive just smaller than the lead size is reversed and threaded.

b. The "pusher" is next threaded onto the wire.

c. The olives and pusher are advanced along the wire. Back slip on the wire is prevented by placing the artery forceps securely on the wire close to the pusher (See Fig. 3A). The leading olive must lie on the wire at the point which leaves just enough wire bare, from eye to olives, so that the wire can be passed to the desired depth below the stricture (usually about 10 cm. distal to it).

STEP THREE: The Dilation

The mouth end of the string is threaded through the eye of the guide wire. The operator, while pulling on the string (See Fig. 3) to keep it taut, in the midline of the mouth, passes the guide wire downwards on it to the predetermined point through and below the stricture. If properly measured, this will be when the first olive reaches the level of the upper incisors. The string must then be displaced into the corner of the patient's mouth and be held without slack by an assistant. The operator grasps the wire (which now serves as the guide) near the forceps and secures it firmly against his hip (See Fig. 4). The

Fig. 4

The wire has been passed to the measured depth, the olives are at the level of upper incisors, the nylon "string" is being held taut at side of patient's mouth. The operator holds the wire and hemostat firmly at hip, maintaining a stable stance, and begins to advance the olives by means of the "pusher" along the guide wire.

Note adhesive strip on pusher at X, which indicates to the operator that he has reached the stricture to be dilated.

wire must not be pushed down or pulled out during the next maneuver. The operator therefore must maintain a stable stance before the patient. Now, by grasping the **pusher,** he slowly and steadily advances the dilating olives through the stricture. Resistance is felt as the wedge passes the narrowed point of the esophagus**. Below the stricture, the olives are stopped by the eye of the wire: a solid resistance easily recognized by the operator.

Fig.5

The operator has passed the dilating olives and pusher through the stricture of the esophagus down as far as the eye of the guide wire. Lifting the pusher above the base of the tongue the wire is pulled upwards.

Note that the nylon string is loose during this maneuver.

STEP FOUR: The Withdrawal of the Dilating Arrangment***

The end of the string, which has been held taut at the side of the patient's mouth, is now let loose. By pulling on the **wire** only, while lifting the pusher to ease it over the base of the tongue (See Fig. 5), the eye of the wire is slipped off the string like a needle being unthreaded, carrying the pusher and olives up with it. It will now be understood that the reversed olive serves as a wedge on the return journey! (See Fig. 6).

FINAL COMMENTS:

If further dilations are contemplated only a few days apart, another length of nylon thread can be tied with a flat sailor's knot onto the one already anchored in the gut. The wire eye passes easily over small knots. If dilations are done at longer intervals, the nylon thread is cut short at the mouth and allowed to go on down. The patient rarely notes the appearance of string at the anus. If he does, it can be cut off there or pulled out and discarded.

**It is helpful to have placed on the pusher a small piece (See Fig. 4X) of adhesive tape marking the distance from the teeth to the stricture, for the operator can judge when the olives are nearing the actual point of obstruction and real pressure is needed.

***This is easier than in the methods when only a string is used for guide.

The operator has pulled on the guide wire, unthreading it like a needle. The olives and pusher are carried upwards with it.

The frequency of dilations is closest at the start, usually two or three days apart, when the olives are gradually increased in size to bring the strictured lumen to good size. No. 41 French bulb is a size which, in our experience, allows taking of solid foods and varied diet without regurgitation. Naturally, also, if a stricture after dilation tends to tighten readily, dilation must be done oftener to keep it open. Usually checking at 4, 8 or 12 week intervals aids in making such decisions.

The advantages of a method such as described are that a patient remains ambulant and avoids the expense of hospitalization. It is an office procedure. It is far superior to dilation with bougies through an esophagoscope, for obvious reasons. It more safely avoids esophageal injuries than when bougies are passed by manual sensation alone without any guide. It is adaptable, by a somewhat complicated set-up, to dilation by air pressure in a balloon at the cardia for so-called cardiospasm or achalasia. Dr. Bertram Sippy maintained that whenever a string can be swallowed and anchored, his method is ideally suited for dilating strictures. The author's experience agrees fully with this statement.

Finally, experience has shown that the tighter and/or longer the stricture, the more desirable it becomes to use a 5 olive wedge (3 leading and 2 reversed) rather than the usual two leading and one reversed.

Illustrations by Mari L. Anderson

ABSTRACT

Bolstad, D. S., Ditzler, J. W.

Local or general anesthesia for esophagoscopy, laryngoscopy and bronchoscopy

Tr amer. Broncho-esophagological Assn. 38th meeting, pp. 103-11, 1958

The authors present their experiences with 325 administrations of Hydroxydione (Viadril.) Ninety per cent were for procedures about the airway. Included were bronchoscopy (10), esophagoscopy (19), suspension laryngoscopy (133) and surgical procedures (163). Viadril, a nonfunctioning steroid, has the following properties: 1) cerebral sedation, 2) pharyngeal and jaw relaxation, 3) respiratory depression, often of only minor degree, 4) no influence on laryngeal function, 5) no analgesia, 6) hypotensive effect and 7) irritation to veins. Used with topical or local anesthesia and small doses of narcotic drugs, it is a satisfactory method for anesthesia for procedures about the airway in the adult. Slowness in onset of action and recovery from effect, vein irritation and the frequent satisfactory usage of solely local anesthetic restricts this drug to procedures where topical or local anesthesia alone appears to be inadequate.

For peroral endoscopy, the authors' technique, when this drug is used is: 1) premedication, 2) careful cocainization of the pharynx and larynx, 3) glucose solution is started intravenously, 4) Demoral and Levallorphan (Larfan), an antagonist to respiratory depression of narcotics, is injected intravenously and 5) Viadril is administered intravenously.

Comment of Abstractor—1. As the authors point out, local anesthesia with premedication is the anesthesia of choice for peroral endoscopic examinations of healthy adult patients by skilled endoscopists. 2. The technique described requires the services of one trained in anesthesiology. 3. This technique, as an aid to the peroral endoscopist, will probably not become widespread.

Camen R. Paynter, M.D.

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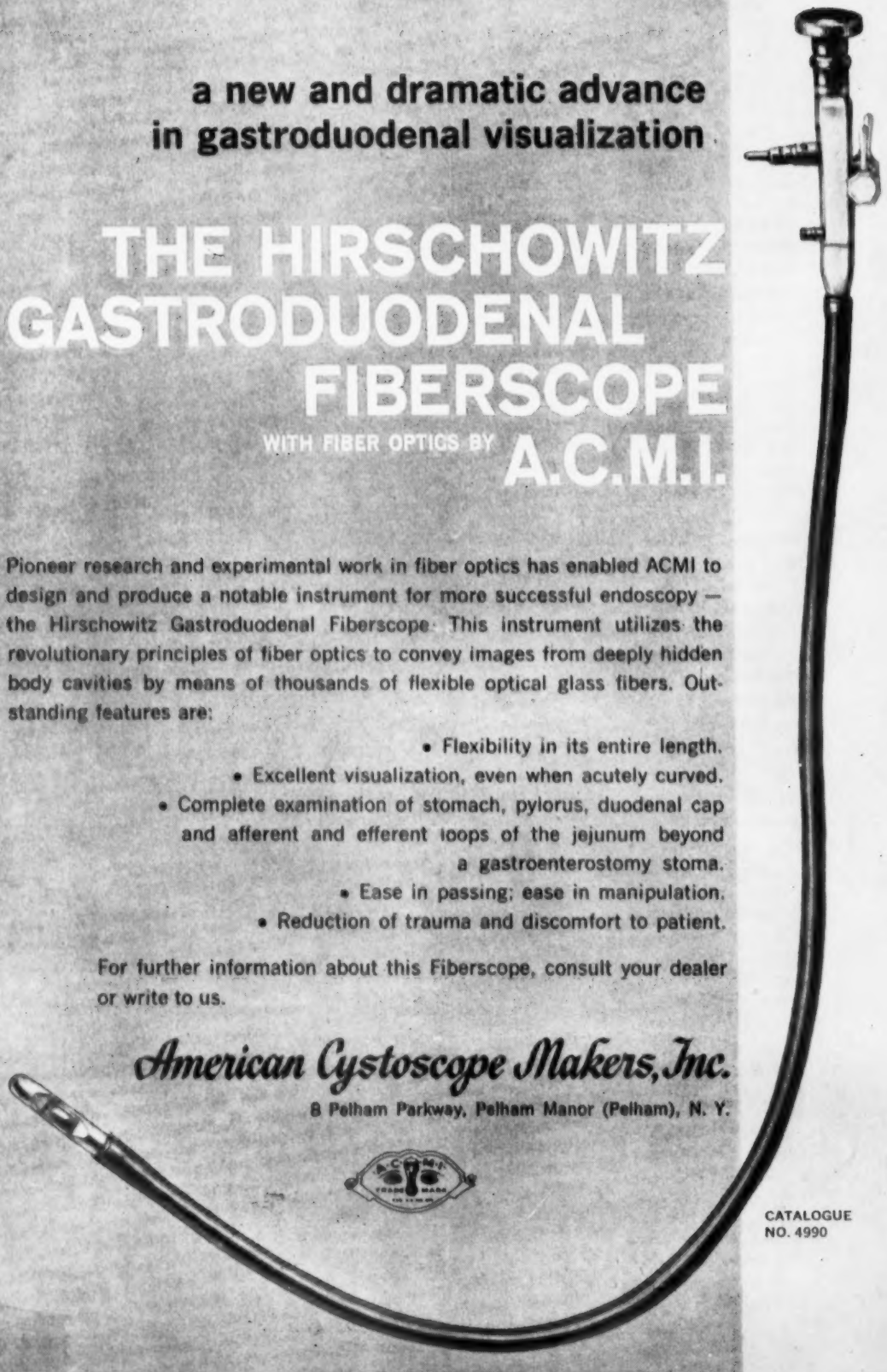

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